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AUTHOR Levine, Esther Zager; Orenstein, Fran M.
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ABSTRACT

This study examined the issue of gender equity among middle school students. Literature of the past 20 years was reviewed, showing that bias in schools still exists. The purposes of the study were to determine if changes in attitudes and behaviors have occurred as a result of gender equitable treatment and to ascertain if exposure to inequitable treatment and the socialization process have established a paradigm for attitudes and behavior. The sample consisted of 1,005 middle school children in grades 5 to 8, 69 teachers, and 10 counselors from 2 suburban middle class school districts in New York and New Jersey. Students, teachers, and counselors were asked to respond to a questionnaire on a variety of gender equity issues and to state their personal views in their own words. The results of the 12 student survey questions are discussed in detail. The responses of the teachers reflect their knowledge of the issues surrounding gender equity and equitable behaviors in the classroom. However, according to the students, the teachers are not treating them equitably. Areas suggested for further study are sensitizing teachers to their "teacher talk," and determining how the community, along with schools, can counsel youngsters towards careers in mathematics and technology when appropriate, regardless of gender. The three survey instruments and results of the student survey are appended. Contains 31 references. (BAC)

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ED 389 457

Sugar and Spice and Puppy Dog Tails
Gender Equity Among Middle School Children

by

Esther Zager Levine, Ed.D.

and

Fran M. Orenstein, Ed.D

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ABSTRACT

We live in a society that sends multitudes of messages to children from birth about how to behave, look, and respond. Families convey the message of conformity to their particular ethnic, social and religious mores, rewarding and punishing according to levels of obedience. These messages can be confusing to children because they begin to conflict as the child moves into the larger world where he or she may receive different messages from friends, schools, communities and the media. As the child develops, enormous pressure builds, and the child may begin to doubt some of the earlier messages and accept other scenarios.

Some of the most important messages children receive in every aspect of their lives are about the differences between genders. They learn from birth that boys are valued for their strength and aggressive behavior, are considered more important, and are more powerful and priveleged. They learn conversely, that girls are valued for their appearance, passive behavior, compliance, and deferment to a male dominated society. It is this paradox that girls and some boys face when confronted by the discrepancy between the paradigm that society creates and their own needs and desires.

This study examines the issue of gender equity in our education system among middle school students. We asked 1,085 students, teachers and counselors to respond to a questionnaire on a variety of gender equity issues and to state their personal views in their own words. The results not only highlight the dilemmas girls face at this crucial growth period in their lives, but also expose the issues impacting on boys. It is the voices of the students and teachers that send the strongest messages regarding the future of women in our society. It is through their eyes that everyone in the next century will view the world and the places of both males and females in school, work and family. Will there be equality for everyone or will 50 percent of the world still take second place?

BOYS AND GIRLS

What are little boys made of, made of?
What are little boys made of?
Frogs and snails
and puppy-dogs' tails,
That's what little boys are made of.

What are little girls made of, made of?
What are little girls made of?
Sugar and spice
and all things nice,
That's what little girls are made of.

The Mother Goose Treasury by Raymond Briggs
Coward-McCann, Inc., NY: 1966.

INTRODUCTION

As children move through the difficult transition from childhood to adulthood they are faced with dilemmas and choices. Society has established a paradigm for conformity, beginning at birth, to what it considers proper and appropriate social and educational experiences and behaviors for children. As a child matures, external and internal barriers develop that tend to discourage girls from reaching their full potential as participants in society. These same barriers cheat boys out of a fuller partnership with girls by preventing them from participating and sharing responsibilities on an equal footing.

LITERATURE REVIEW

Girls, especially, are bombarded with negative messages from parent's, peer's, teacher's and the media's lack of awareness of the unconscious well-intended behaviors toward them that affect their socialization. Due to the structure of the heterogeneous classroom, time constraints, curriculum demands and discipline issues, educators in particular are at risk of unknowingly creating an atmosphere that is a barrier to the development of the full potential of children (Orenstein, F., 1992).

Examination of the ideal viewpoint reveals that a healthy self-esteem includes an appropriate sense of potential, competence, and innate value as an individual. For society to work, girls need to take up space in the world, to be heard, and to fully express their views and ideas (Orenstein, P., 1994). In the ideal classroom girls feel secure enough to call out the answers and actively participate without fear of being wrong, embarrassed or ridiculed by the boys or the teacher (Sadker & Sadker, 1994). This however is not the case in most classrooms. Boys are getting the message that it is okay to demean and devalue girls. Women in literature are referred to as passive or omitted altogether. They are defective in comparison with men (Miedzian, 1991). Children's literature and fairy tales portray women as beautiful, helpless, delicate, mindless, malleable, dull-witted and in

need of rescuing by male heroes. Children observe male female roles at home, on television, and in movies. They see that men are in charge and have authority and power. They observe that women are powerless because the media encourages girls to lose gracefully and defer to men (Pogrebin, 1980). This is a society that learns through auditory and visual senses. One hour of prime time television, through advertising and as part of a story line, can convince children that women are valued as sex objects used to attract men. This behavior translates into unequal treatment of girls and women in school, work, and society.

Ideally, girls and boys have equal opportunities to play sports and have the same quality and amount of sports equipment. In reality, boys get a ten times larger share of the playground while girls usually stay on the sidelines watching or playing in small groups on the edge. Girls are offered jump ropes and boys are offered balls. Girls are usually excluded from large group games because the boys choose who will play (Sadker & Sadker, 1994).

Despite Federal attempts through Title IXB of the Education Law to insure equal opportunities in sport; schools have made very little progress either in integrating girls onto boys teams or providing them with the same opportunities (Fields, 1984). Every time a girl makes it in a *boys* sport, she makes headlines. True, a few girls have made it onto boys' teams in such diverse sports as ice hockey, soccer, tennis, and even football, but "its still rare enough that sports officials can point to cases here and there" (Newsday, 1994).

Our educational system reflects society's beliefs in the following stereotypes: girls perform more poorly than boys in math; female students of technology are not interested in the subjects; or that these subjects are not feminine pursuits (Fennema, 1984, 1990; Orenstein, F, 1993; Sadker & Sadker, 1994). Teachers may send subtle messages to girls that mathematics is not relevant or appropriate for them (American Association of University Women (AAUW), 1990; Leder, 1991). They also believe that mathematics is

a male domain and does not have a place in a girl's future (Cheek, 1984; Koehler, 1990; Meyer & Koehler, 1990).

Much of the same sort of attitude exists in the job market. In October, 1993, the U. S. Department of labor released a report of working women. They found that the business world still pays women less than men in almost every job, and that it defines jobs done by women as less valuable than those done by men, even though they are often the same jobs. Continued male domination in the business world has not adjusted to the Labor Department finding that "women work for the same reason men do - economic necessity" (Sandberg, 1994, p.21). The message is not as subtle in the work place as it is in the schoolroom.

In the classroom teachers value girls and boys differently. Teachers tend to regard girls as neat, nice, well-behaved and unquestioning of authority. Boys are considered curious, more difficult, aggressive, ambitious and challenging of authority (AAUW, 1990). Beginning in preschool, teachers of young children praise girls for their appearance, cooperation and obedience and boys for their achievement (Derman-Sparks & the A.B.C. Task Force, 1989, p.3). Accordingly, boys are shown how to do it, while girls have it done for them. Boys learn to stand on their own while girls learn helplessness. The clear message to our boys is that girls are needy and boys are needed. Girls not only learn not to do for themselves but to depend on boys to do it. Boys want to step in and solve the problem, as is demonstrated in many science lab classes.

In studies of science classrooms it was found that boys often perform the science experiments while the girls watch or boys actually take the experiment away from the girls (Orenstein, P., 1994). Many girls self-select out of the sciences and teachers and counselors support these choices (Walker & Mehr, 1992; Sadker & Sadker, 1994). Allowing girls to go for the easy way out by dropping difficult math and science classes, or by settling for lower grades feeds their helplessness (Orenstein, P., 1994).

A greater understanding has been reached of learning styles and strategies that reach specific populations of students. Implications of this show us that there has to be a concerted effort to change the methods of delivering academic courses, science and technology information and experiences, so that young women and others at risk of failing can fully participate in science classes, science fairs and science and technology related occupations (Levine, 1992). Teacher surveys reflect this perceived inadequacy in reaching all students. The results of a survey of science teachers was summarized and compared to the results of technology and academic teachers. Some of the most striking differences occurred in such instructional practices as: the use of interactive material; computers; videos; films; cooperative learning methods; and extra credit opportunities. (Levine, 1993).

The AAUW (1990) noted that by the year 2000 this country will need over 700,000 new scientists and engineers and will also need three times the number of women in these fields than we now have. They further suggest that those girls, now in sixth grade, will represent 47 percent of the workforce and will need to be tomorrow's leaders in science, technology and government.

Hafner (1993) focused on three women in their mid to late twenties who majored in computer science and engineering at M.I.T. Very early in their lives teachers and family members told them they could do anything they wanted and this support and encouragement continued during adolescence. However, they discovered that courses at such prestigious school as M.I.T. are still geared toward men by incorporating the fierce, competitive one-upmanship that men prefer in their learning style. Women, however, work better in teams and help each other rather than compete with each other. These women found it harder to be taken seriously in this male bastion. Statistically, the career choices of these young women were the exception to the rule. Women received less than one-third of the bachelor's degrees in science and engineering and 13 percent of the Ph.D.'s

in computer science in 1990. Although comprising 50 percent of the workforce, only 15 percent of scientists and engineers are women.

Walker and Mehr (1992) studied America's brightest women who had been attended New York City's Hunter High School for intellectually gifted girls. The authors describe the many ways these bright young women under achieve. Despite what was described as excellent teaching, the lack of role-models and counseling caused many of these girls to reduce their ambitions and expectations and conform to society's limitations.

Computers, introduced into schools over 25 years ago, have created further gaps in the education of girls and boys. Boys tend to monopolize computer centers and clubs in schools and attend computer camps. Computer games are oriented toward boys. These games are more violent, and are programs where male characters take important roles (Sadker & Sadker, 1994). One third of the American families have computers in their homes and men are the largest purchasers and purveyors of computers and programs. Their sons are raised to be explorers of their environment, "their daughters are told to keep their hands clean and play with their dolls" (Kantrowitz, 1994, p. 51). Exploration is a pre - training for working with computers where people spend a long time rooting around in programs for solutions, fearless of getting their hands dirty. Computers programs are geared to action-oriented activities that appeal to boys because most designers and programmers are male. Using a name like Game Boy, suggests that girls would not be interested in this playing with it.

In actuality, boys and girls are both equally interested in computers until 5th grade when boys increase their usage and girls use them less and less. Girls are discouraged by societal attitudes that believe that, except for word processing, computers belong to boys and men. The ratio of men to women studying computer science is three to one. It has come to be known as an unemotional job that does not interface with other people, the antitheses to how girls are raised in this society. Some researchers, looking into the different learning styles of boys and girls, suggest that boys respond to "highly logical and

hierarchical" programs while girls need to use an "interactive" approach (McAdoo, 1994). To combat this problem, some schools are introducing computer hours and classes that are set aside exclusively for girls and group projects that enhance the cooperative learning styles of girls. Until it is pointed out, many schools do not realize that computer clubs and advanced computer classes are dominated by boys (Morse, 1995).

The issue of equal vs. unequal treatment of girls and boys in sports, science, mathematics, computers and other technologies, implies enormous ramifications for development of a future workforce that includes men and women who can work together in a technological age. This country and the girls who will make up the workforce of the next century are shortchanged when "independence and self-esteem are short-circuited..." (Sadker & Sadker, 1994, p.81). "Labor Department statistics show that women now earn 71 percent of what men do ..." (Gutman, McGraw & Sieder, 1994, pp. 50). In our schools there is a hidden curriculum in which boys learn that anything they say or do, right or wrong, relevant or irrelevant, smart or not, is acceptable. They learn to disrespect girls and become self-centered. Girls, on the other hand, learn deference to boys and self-abnegation. This happens when girls try to claim attention and not follow the rules, as in calling out, and are not rewarded for this behavior. Boys, however, are rewarded for this condoned behavior. Thus, girls become more silent and boys more vocal (Orenstein, P., 1994).

Teachers have more interaction with males than with females and respond more frequently and differently to the questions of male students. There is subtle, unconscious behavior on the part of teachers to respond less often to girls and to be more critical of girls. Teachers will often solve the problem for her if a girl responds with the wrong answer, yet encourage a boy to solve it for himself or expound on his answer. This prevents girls from becoming autonomous and independent learners who can employ critical thinking skills to solve problems (AAUW, 1990; Bridgman, 1984; Orenstein, F, 1993; Sadker & Sadker, 1994).

Students come to believe that the way they are treated in the classroom by their teachers is indicative of their personal success or failure. Girls come to believe that boys are more important and more competent and internalize the message of failure. Feeling more secure and successful, boys can externalize difficulties and mistakes as not important and move forward (AAUW, 1990; Meyer & Koehler, 1990). Girls in the early grades believe that they can succeed in math, science and technology. Up to adolescence, studies show no difference in the self-esteem and confidence of girls and boys to perform well academically and succeed in future career aspirations. However, by high school, only 29 percent of the girls compared to 46 percent of the boys were confident and exhibited good self-esteem (AAUW, 1990). As self-esteem drops, female behavior becomes passive resistant, girls opt out and become silent and invisible. They became aware of the differences between genders, fearing ridicule for their mistakes and ostracism if they are correct.

Some schools in California have instituted all girl math and science classes. The girls feel they get much better grades, feel more comfortable asking and responding to questions, can learn in their own way and at their own pace, and are interested in pursuing higher mathematics and science. In coed classrooms the greatest complaint is competing with boys who want to shine and be the center of attention, who shout out answers, who take all the teacher's attention, and who get annoyed while girls process problems at their own pace (Gross, 1993).

An alternative to single-sex schools or classes is a small group collaborative learning situation because girls learn through relationships with others as they are socialized to do from birth. This learning occurs through group projects where girls can work together and resolve the problems without a boy stepping in to take it away from them (Stipp, 1992).

In an interview, Myra and David Sadker said that girls in single sex classroom or school settings have higher self-esteem, better achievement levels, and take higher math and science courses. However, girls' programs traditionally receive fewer resources

because they are less valued as a group. This might also undermine years of work to eliminate sex discrimination in education under Title IX (Staff, 1994).

Civil rights officials feel that rather than segregate girls, teachers need to be trained to understand the different ways boys and girls learn and adapt their classrooms to each of these modalities (Gross, 1993).

Very bright, high achieving girls may suffer the most. They want to succeed, but they also want to conform to their peer group. They may try to hide their intelligence to fit in because it is more important to be popular and high on the social hierarchy.

Girls are often forced to choose between fulfilling their potential or conforming to society. It is this paradox that girls confront at adolescence at the same time their bodies are changing and they are becoming sexually aware of themselves and their peers. They are also facing course and career choices and are trying to assimilate 12 years of subtle, eroding messages about their abilities (Orenstein, F., 1992; Orenstein, P., 1994; Sadker & Sadker, 1994).

Raised to be the center of attention; active, aggressive and independent boys stand out more in teachers minds. They take up more space, they are more vocal and louder and can demonstrate their leadership potential. They also get more and tougher disciplining, particularly if they are underachievers or are considered trouble makers with poor expectations. Boys at the top of the class are groomed to be future successful leaders. As boys grow up they are discouraged from demonstrating a softer, more feminine side, and sometimes are punished or humiliated by fathers or sports coaches for such behavior. Boys are expected to be athletic and compete in sports and those who are not athletic are teased, unpopular and isolated. As a result boys come to despise femininity and feminine behavior and believe that they are superior to girls (Sadker & Sadker, 1994).

PURPOSE

Research in the field of gender equity in schools still demonstrates the existence of unjust treatment between teachers and students and in peer to peer relationships. Studies have shown that around the onset of adolescence, exposure to years of subtle biases causes girls' self-esteem to drop when compared to boys of the same age (AAUW, 1990). Therefore we approached middle school children from ages 10 to 14 and their teachers and counselors to learn about their experiences in the classroom and how they viewed their treatment by teachers, peer interaction, and their opportunities as boys and girls in a school setting.

We looked at the literature of the past 20 years which clearly shows that bias in schools still exists. Many laws and programs in the areas of required affirmative action programs and sexual harassment policies have been enacted to protect students from gender bias. School districts are now required to face up to the issue of equal treatment according to gender as well as racial and ethnic biases. Based on the literature, it appears that the degree of biases may not have changed as a result of gender equity training and awareness. It has not been demonstrated in the literature that educators and students today have altered their behaviors and the treatment they give and receive.

The students in this study have had exposure to ten to 14 years of unconscious, well-intended biases in the classroom. This may have created a situation where boys believe that they are entitled to preferential treatment and girls believe that this is the way it is supposed to be. If this is true, then students have developed blinders when it comes to objectively viewing their treatment in the classroom and now accept such treatment as normal and natural.

One purpose of this study is to determine if changes in attitudes and behaviors have occurred as a result of awareness of gender equitable treatment. The other purpose is to

ascertain if exposure to inequitable treatment and the socialization process has established a new paradigm for attitudes and behavior.

METHODOLOGY

Sample

The sample is 1,005 middle school children in grades 5 to 8 and 69 teachers and ten counselors from two suburban middle class school districts in New York and New Jersey. The New Jersey district is a seashore community of 18,500. The middle school population has 650 students grades 6 to 8, 50 teachers, 2 guidance counselors, and a child study team. The school's racial make-up reflects that of the town, 99 percent white. This is considered a blue collar community with less than one-third of the parents with advanced degrees. It is a dual income household community, and the primary residences are single family homes. The 1989 per capita income was $18,770 and the median family income was $46,214.

The New York district is a town outside of New York City also near the seashore. The population of 20,000 has twice as many senior citizens as preschool children. The elementary school population has 720 children in grades K through 6 and the junior high school includes 650 students in grades 7 to 9. Together the schools housed 120 teachers, counselors and administrators. The median income is $44,000 per household in this primarily working class population. Racially, 84.7 percent of the student body is white.

A sampling of 100 students and their teachers from this population was previously surveyed, and the results from the larger sample were found to be consistent with the pre-survey results.

Instrument

Three survey instruments for students, teachers and guidance counselors were used in this study (Appendices A, B and C). The instruments were accompanied by a cover letter explaining the purpose of the survey and instructions for administration. Summaries of results of these instruments can be found on Tables I, II and III in the Statement of Results section following.

DISCUSSION OF THE PROBLEM

Self-perception may be defined as how a person sees him or herself. As a person develops cognitively, he or she gradually develops a sense of self awareness that expands with maturity. People live by learning a set of norms based on information gleaned from society. This socialization creates a sense of pride, or loss of self-esteem, guilt or shame, goodness or badness, intelligence or stupidity, and finally effectiveness or helplessness (Skolnick, 1986).

Middle or junior high school is the transition from middle childhood and elementary school to adolescence and high school. Children are thrust into a new and strange educational setting where they may have to make new friends and learn to deal with multiple teachers and classes. They are being groomed for adolescence but are often expected to behave and learn as adolescents before they are developmentally ready. Their level of competence often drops as they are faced with anxiety provoking issues such as school structure, peer acceptance, identity issues and academic failure (Skolnick, 1986).

Developmentally, preadolescence is the stage of industry and productivity preparation through the use of tools to develop the skills needed to compete as an adult. At this time, school supersedes the family as the place of learning and training. It is at this point in the child's development that the challenges faced will impact on competition with peers and ultimately develop into a sense of identity. If the child feels inadequate either in

relationships with peers or use of tools, that child will fail to identify with success and competence (Erickson, 1963).

As children reach pre-puberty their self-concept evolves to include an internal, private world beyond the concrete, with external ideas of appearance, living arrangements and activities. They start to see themselves from a more internal psychological perspective. Their thinking is now more abstract and they are able to put words to these thoughts and feelings. Pre-pubescent boys tend to function in large groups and are more intolerant of girls and very conscious of masculine versus feminine behavior and attributes. Stereotyping of gender becomes very strong at this age and while a girl who behaves in *masculine* ways is accepted, boys who behave in *feminine* ways are rejected by their peers and their fathers. Skolnick further states, "Whatever the origins of sex role stereotyping in middle childhood, it is a profound influence on the children's views of the world, themselves, and their future possibilities" (1986, p.417).

Adolescents, according to Piaget, have reached the stage of formal operations where they can resolve complex problems in a systematic fashion, and perceive the consequences of actions through thinking about their own thought processes. Young people are seeking an identity that will incorporate sexual, moral, ethnic and work interests (Skolnick, 1986).

This identity is crucial as the child now enters early adolescence primarily concerned with peer acceptance and how the tools and learning acquired can be used in the future. Being different is intolerable to the adolescent who must conform to a group of peers and remain faithful to them (Erikson, 1963).

This is the point at which family status, education and economic level come into play in choosing careers. The early adolescent has developed identity related to his or her family background and without other intervention the child will usually remain within the limitations of this family. Education therefore plays an important role in helping the child attain a positive self-perception. Subtle biases erode that process.

STATEMENT OF RESULTS

Three surveys, of students, counselors and teachers were used in this study. The surveys were accompanied by a cover letter which was read by each group explaining the purpose and administration of each form.

This study is based on theoretical research on the issue of gender equity in the schools. We anticipated that responses to each of the statements would be neutral to both boys and girls if there were no longer inequities. The results, however, showed that the students did agree or disagree with the statements in a significant manner for almost every question studied. The statistical measure used was Chi Square, a technique also known as *Goodness of Fit*, which allows one to determine whether or not a significant difference exists between an observed number of cases falling into each category, in this case *agree or disagree*, and the expected number of cases (50 50) based on the null hypothesis, which would be due to chance. Significance at $p = 0.01$ level would indicate that the two variables are related to each other in the population studied.

Although no causal claim can be made for differences found, the researchers used this test to show that some of the differences are greater than would occur due to chance sampling of two identical populations.

In a society which professes to value equality for males and females, many inequalities continue to exist in the educational, home and work settings. We chose to explore, by way of surveys, perceived attitudes by students, teachers and counselors to some of the areas of inequality currently reported in the literature.

Discussion of Survey Results

When asked if ***"Teachers speak to boys and girls in the same way,"*** students in grades 7 and 8 disagreed. These results were not due to chance (see Appendix D). In responding to the open ended question boys often said; *" I think girls are favored because they are quiet and nice";* Boys also indicated that, *"girls get more respect than boys do*

and are treated with more courtesy...boys are yelled at more." One boy stated, "*teachers have more patience with girls and are shorter tempered with boys.*" Grade 7 & 8 females felt, "*Most teachers take girls to be quieter and more smarter than boys. They think we are as sweet as can be. For instance, when a boy gets in a fight with another, it's like no big deal, but when a girl gets in a fight, it's 'OH MY GOD!'*" Girls also commented that, "*Teachers yell at boys more than girls and are meaner to girls than to boys*"..."*Teachers let boys talk back*". One girl said, "*In gym boys do more, but in class they get yelled at more*".

In grades 5 and 6 some boys commented, "*The teacher never ever screams at girls the way she screams at boys.*" and "*Male teachers can be rougher on boys than on girls*" or "*Boys are accused more often*". According to the girls in these grades, "*Teachers are hard on boys and sweet to girls.*" and "*Boys are taught more carefully around some teachers because they think girls will use it less in life and boys will use it the most. I think this is wrong*" or "*Some women teachers get madder at the boys.*"...and "*Teachers yell at boys more*". Teachers also commented on this statement, "*In the classroom boys and girls are called on equally. I think teachers expect the same quality of work from either gender. I think the difference lies in the behavior of the boys and girls and the disciplinary measures taken. Boys seem to get punished more often and more severely. Girls seem to get away with talking out or talking to friends.*"

In response to the statement, "***Books, posters and ads show girls and boys doing activities that are the same***" the students in all four grades surveyed *do not agree* that the media is free of gender bias (see Appendix D).

The third statement, "***Teachers call on girls less often than boys.***" revealed significantly that the students in all of the grades in this study *do not agree* with the statement (see Appendix E). This disagreement is qualified by many of the students who said it really depended on the teacher, and that female teachers favored girls more, while male teachers favored boys. This was articulated as, "*Male teachers rarely call on girls.*"

or *"Girls get called on more!"* One older student said, *"I think girls get called on more because boys are always goofing around, so by the teacher's good judgment he or she wants to get this over with so the class can learn so he or she estimates the person that will get the right answer and calls on her."* Others believe, *"Girls are favored, called on more and get better opportunities."* or *"Girls always get what they want and are always picked on when the teacher asks a question."* and *"Some boys always get called on while some girls don't get called on at all."* One student claimed, *"Teachers pick on boys just because they are not paying attention."* A female student in grade 7 observed, *"Boys are yelled at in class or called on to answer a question even when their hand is not up because teachers think they're not paying attention."* Another said, *"When a girl is smart, they kind of expect it, but when a boy says something smart they jump up and down like he was the President!"* or *"Boys tend to be more active in class participation, that's why teachers call on them more."* Comments of girls in the lower grades were contradictory, for example they said, *"Teachers call on girls to see if they know the answer but they call on boys because they think the boy knows the answer."* or *"Boys get called on more in math class and get easier questions."* Others observed, *"Girls get called on more than boys because girl teachers like the girls and think the girls understand better."*

The analysis of the results on the statement, "***Teachers think boys answers are more interesting than girls answers***." are significant (see Appendix E). Students in all groups *disagree* more often with the statement. Only the younger boys commented, *"Some teachers think that boys are better than girls"..."Girls are better at reading and social studies and boys are better in math and science"*. They noted, *"Teachers like girls reports better than boys"*, but, *"Boys are expected to do better than girls"* because, *"Teachers think girls are smarter than boys"*. One student said, *"The teacher asks a boy, 'Where did you get that answer from', but girls are not asked"*.

Do students believe that ***"Teachers think girls work is neater than boys work"?***

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The results are significant for all groups except the 5-6th grade girls. All students, except the girls in that age group, *agree* that teachers think girls work is neater than boys work (see Appendix F). Only the older girls wrote responses such as, *"Teachers think girls are harder workers"*; *"Teachers expect girls to be neater"*; *"Girls are expected to do better"*; and *"People think girls are smarter and boys are more athletic." "In math class boys are called on more than girls and boys have more right answers than girls do"*.

Number six in the student survey, ***"Girls are encouraged to study mathematics and technology at advanced levels"***, brought about significant results. Students in the upper grades *disagree* that girls are encouraged to study these courses (see Appendix F). Neither boys nor girls at this age are encouraged to study at advanced levels, as was supported by the counselor information. One of the teachers commented, *"Following the logic of this survey, perhaps you should be asking if we encourage boys to become nurses or teachers"*. Another teacher expressed an idealized view by telling us, *"This survey was difficult to complete because agree and disagree are too extreme. In some situations (or cases) some of the statements may apply and in others they may not. I was tempted to put down "sometimes" for several answers. (A lot depends on the individual boys and girls involved and not the teacher.) If a girl shows ability in math or technology she should be encouraged to pursue her interests. If she doesn't why bother to push her into a field for which she has no interest. The same applies to boys. All children should be encouraged to study areas in which they have an interest."*

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Table 1
A SURVEY OF TEN GUIDANCE COUNSELORS ON GIRLS' PARTICIPATION IN ADVANCED MATHEMATICS AND TECHNOLOGY COURSES

Description of Students	Description of Schools Surveyed			
	RURAL	SUBURBAN	SUBURBAN	URBAN
	Homogeneous ethnic and economic levels			
Number of Students	250	850	400	457
Number of Female Students	100	410	100	120
Number of girls studying higher mathematics	3	300	30	80
Number of girls electing technology courses	No electives in technology are currently available at these grade levels.			

The responses to question seven, ***"Boys are encouraged to study mathematics and technology at advanced levels."*** are significant for the total sample and for the 7-8th graders (see Appendix G). The older students *disagree* with the statement that boys are encouraged to study mathematics and technology at advanced level. Questions six and seven therefore indicate that in the middle or junior high school students are not being encouraged to study mathematics and technology at advanced levels. This result indicates the need to counsel students as to opportunities which will exist in high school and in future careers in these areas. The older boys observed, *"More boys than girls are in the advanced classes"* and *"Boys are favored more, also in science"*.

The responses to the statement ***"Girls and boys have equal opportunities to play sports"*** are significant for all groups (see Appendix G). The students *agree* that girls and boys have equal opportunities to play sports. Yet it is this area, more than any other that

brought out answers on the open-ended question about inequities in the types of sports opportunities and equipment available to boys and girls. Both groups pointed out that the girls had less opportunity and lesser fields and equipment than the boys. Boys commented, *"Some sports aren't made for girls and boys (to play together) like football and volleyball." "Boys play football, girls don't."* They also said, *"Boys are favored in gym and sports." " Boys and girls are treated differently in sports." "Most girls don't play sports". "Boys have the better 'in' (popular) sports". "More girls are cheerleaders than boys ". and "Girls are pressured not to do certain things, for example wrestling". "Most people believe boys are better in sports".* Other's said, *"Girls sports equipment is older than boys". "Girls get to play sports that we can't, like field hockey".*

Girls said, *"Boys do certain sports that girls don't do, they are more professional and competent in sports."* Another disclosed, *"Well, since I'm a girl, boys don't let me play football with them. Football is one of my favorite sports. Well I got something to say to them. I may be a girl, but I can play football as great as any other kid in this school. ALL MEN AND WOMEN ARE CREATED EQUALLY!"* Girls observed, *"Most people think of sports like football as boys sports, when actually in my opinion, girls have an equal amount of ability and right to play sports as boys do". "I think that people should stop thinking of girls as 'fragile' and should encourage them to play sports, etc. just as much as boys." "As far as sports goes, I think we have equal opportunities to* ***join*** *them, but when it comes to* ***playing*** *them, there's a big difference". Some girls said, "People call basketball, wrestling, football and baseball 'boys' sports, but there is no such thing as a 'boys' sport if a girl can play it." "Some gym teachers think boys are better in gym than girls". "Girls are discouraged from joining contact sports like wrestling". Finally they shared, "Girls can play good in sports or do anything else boys can do".* but *"No one expects girls to do well in sports".*

In response to statement nine, "***Teachers encourage girls to explain their answers in mathematics***". 7th and 8th graders disagreed significantly (see Appendix H).

One older boy stated, *"Girls are usually not required to expand their answers in math class, boys are."* This cognitive approach to mathematics, requiring students to be able to explain the process by which they got their answer, is a recent innovation in the teaching of mathematics and is probably not widely practiced. A teacher said, *"Ten years ago my responses would have indicated a greater bias against females in math courses,"* and other teachers said, *"Girls, given the same opportunity, can and have performed just as well as boys in science and mathematics."*

When queried as to whether ***"Teachers encourage girls to demonstrate their understanding of technology***," the results were statistically significant (see Appendix H). All students, with the exception of the 5-6th grade boys, *disagree* with the statement that teachers encourage girls to demonstrate their understanding of technology. The researchers feel that this question did not satisfactorily probe the question of how understanding of technology was tested and demonstrated by any student. Therefore we do not feel we have an adequate grasp of the way students are assessed in this discipline.

However, on the statement, "***People think boys are better in technology and mathematics***," all of the results are significant (see Appendix I). The students *disagree* with the statement. Yet, according to their written comments, science, mathematics and technology are classes where different treatment is perceived: For example the girls said, "*Sometimes teachers treat guys like they're more advanced in certain subjects. (like technology)." "In technology, girls are sometimes thought not to know how to do things." "Boys are treated better in math." "Boys are expected to do better and get better jobs."* They also asserted, *"Technology class encourages boys more than girls."* Younger boys also promulgated the old stereotypes, such as; *"Technology is for boys and home economics is for girls,"* or *"Boys do better in math."* Comments of grade 5 females included complaints like, "*Boys get to do things like get time on the TV and on computers.*"

All of the students *disagree* with the statement that ***"There are few women in mathematics and technology careers."*** These results are significant (see Appendix I). As one seventh grade male said, *"There are more options open to boys."*

Additional Student Views from the Open-Ended Question

Students had additional comments that revealed how they believed males and females behave and the roles they have in their society. Older male students believed, *"Boys should be treated with respect, but girls shouldn't because they are always in a bad mood." "Boys are always treated with respect."* However they said, *"Boys make fun of other boys more than girls make fun of other girls."* and *"Boys think building and lifting is men's work."* Additionally, *"Boys think women belong in the kitchen."* and *"Girls are annoying."* Others however felt, *"Girls may be treated better than boys." "Boys and girls are treated equal sometimes."* and *"Girls and boys are equal, I think they are treated the same." "Girls are given more rights."* Several boys commented, *"Girls are supposed to be neat and smart."* and *"Girls are treated better than boys because they are usually smarter."* They said, *"Girls are allowed to do anything they want." "They walk all over the boys and they get away with it." "The girls act like they know everything, but they are really dumb."* Girls in grades 7 and 8 remarked *"People should stop assuming that girls are smarter and more verbal than boys. Reading and schoolwork should be encouraged as needed in careers for everyone, girls aren't necessarily more organized than boys, and that bothers me...that people think that!"* They said, *" Girls do better in school than boys because it is expected." "Boys are known to be stronger and faster."* and *"Girls are known to be petite, flowery, pinky little girls (Yeah, right!)." "Girls are labeled a* lot." The girls stated, *"Boys are stupid or annoying or sexist!" "They tease us about being goody-goody people (smart) who 'kiss-up' to teachers." "Girls are smarter and boys are better at sports."* Some girls thought, *"Boys are more popular than girls."* and *"Boys can explain their way out of anything." "It doesn't matter if they fail a test, they (boys) can re-do it." "Boys think they're the best."*

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Student survey results are summarized below on Table II. and teacher survey results summary appears on Table III following.

Table II

TOTALS FROM 1006 STUDENT SURVEYS
SUBURBAN COMMUNITIES NEW YORK AND NEW JERSEY

BOY OR GIRL age 10-14 grade 5-8

PLEASE WRITE AGREE OR DISAGREE TO EACH STATEMENT BELOW

BOYS A	D		ALL AGREE	DISAGREE	GIRLS A	D
QUES_1		Teachers speak to boys and girls in the same way				
203	268		452-45%	544-55%	249	276
			standard error=0.016; approximately 3% points			
QUES_2		Books, posters and ads show girls and boys doing activities that are the same				
206	256		431-44%	558-56%	225	302
			standard error=0.016; approximately 3% points			
QUES_3		Teachers call on girls less often than boys				
102	348		207-21%	763-79%	105	415
			standard error=0.013; approximately 2.5% points			
QUES_4		Teachers think boys answers are more interesting than girls answers				
92	344		228-24%	736-76%	136	392
			standard error=0.014; approximately 3% points			
QUES_5		Teachers think girls work is neater than boys work				
303	164		598-60%	397-40%	295	233
			standard error=0.016; approximately 3% points			
QUES_6		Girls are encouraged to study mathematics and technology at advanced levels				
196	259		405-43%	546-57%	209	287
			standard error=0.016; approximately 3% points			
QUES_7		Boys are encouraged to study mathematics and technology at advanced levels				
206	253		414-43%	552-57%	208	299
			standard error=0.016; approximately 3% points			
QUES_8		Girls and boys have equal opportunities to play sports				
281	179		594-60%	388-40%	313	209
			standard error=0.016; approximately 3% points			
QUES_9		Teachers encourage girls to explain their answers in mathematics				
196	259		401-41%	573-59%	205	314
			standard error =0.015; approximately 3% points			
QUES_10		Teachers encourage girls to demonstrate their understanding of technology				
197	285		398-40%	598-60%	201	313
			standard error =0.017; approximately 3% points			
QUES_11		People think boys are better in technology and mathematics				
155	295		329-34%	639-66%	174	344
			standard error =0.016; approximately 3% points			
QUES_12		There are few women in mathematics and technology careers				
163	267		328-35%	608-65%	165	341
			standard error = 0.016; approximately 3% points			

Table III

SUMMARIZED TEACHER SURVEY RESULTS

of Sixty-nine - 5th through 8th grade Classroom Teachers

Females __ 48 ___ Males _ 21 __

	FEMALE A / D	MALE A / D
1. Boys are more likely than girls to be called on in the classroom.	10 / 36 22 / 78%	4 / 15 21 / 79%

Chi Square = 31.8009 DF = 3 Prob. = 0.0000
This result is significant, teachers *disagree* with this statement.

2. Boys usually answer questions with greater clarity than girls.	4 / 41 09 / 91%	1 / 20 05 / 95%

Chi Square = 47.0127 DF = 3 Prob. = 0.0000
This result is significant, teachers *disagree* with this statement.

3. Girls and boys are encouraged to study for careers in mathematics at advanced levels.	25 / 15 63 / 37%	10 / 7 59 / 41%

Chi Square = 3.02941 DF = 3 Prob. = 0.3871
The results support the null hypothesis.

4. Girls and boys are encouraged to study for careers in technology (information/communication) at advanced levels.	25 / 15 63 / 37%	11 / 7 61 / 39%

Chi Square = 3.38889 DF = 3 Prob. = 0.3355
The results support the null hypothesis.

5. More boys than girls study mathematics at advanced levels.	26 / 9 74 / 26%	8 / 11 42 / 58%

Chi Square = 8.73083 DF = 3 Prob. = 0.0331
The results seem to support the null hypothesis, but far more female teachers agree with this statement than male teachers. That result may be from their own experience as girls rather than from knowledge of what is happening in the schools right now. It seems to be an area which warrants further study.

6. More boys than girls study for careers in technology.	27 / 9 75 / 25%	5 / 6 45 / 55%

Chi Square = 9.09091 DF = 3 Prob. = 0.0281
Although the results are supportive of the null hypothesis, they suggest the same scenario as do the results of question five, and should be studied further.

7. Textbooks and other print and film matter show girls and boys doing the same activities.	21 / 23 48 / 52%	11 / 8 58 / 42%

Chi Square = 0.709957 DF = 3 Prob. = 0.8709
The results support the null hypothesis. Whereas most of the students disagree with this statement, teachers are not supporting either view.

8. Teachers speak to boys and girls in the same way.	22 / 20 52 / 48%	10 / 6 63 / 37%

Chi Square = 1.09524 DF = 3 Prob. = 0.7782
The results support the null hypothesis. Most students who commented on this would disagree with the statement.

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9. Teachers encourage girls and boys to explain their answers fully or demonstrate how they got their answers. 31 / 6 (84.16%) 17 / 3 (85.15%)
Chi Square = 26.6919 DF = 3 Prob. = 0.0000
The results are significant, teachers *agree* with this statement.

10. Boys are usually better at mathematics than girls. 2 / 40 (05.95%) 1 / 18 (05.95%)
Chi Square = 48.1196 DF = 3 Prob. = 0.0000
The results are significant, teachers *disagree* with this statement.

11. There are fewer women than men in mathematics careers. 35 / 7 (83.17%) 14 / 1 (93.07%)
Chi Square = 29.9333 DF = 3 Prob. = 0.0000
The results are significant, teachers *agree* with this statement (more so than the students do.)

12. Boys are more likely than girls to speak up in class. 15 / 31 (33 / 67%) 7 / 13 (35.65%)
Chi Square = 7.36522 DF = 3 Prob. = 0.0611
The results support the null hypothesis.

13. Boys are more likely than girls to argue with the teacher when they think their answer is right. 19 / 24 (44 / 56%) 7 / 15 (32/68%)
Chi Square = 3.49049 DF = 3 Prob. = 0.3220
The results support the null hypothesis.

14. Boys work is more complete than girls work. 0 / 45 (0 / 100%) 1 / 14 (07/93%)
Chi Square = 54.3111 DF = 3 Prob. = 0.0000
The results are significant, the teachers *disagree* with the statement.

15. Girls work is praised for appearance, boys work for accomplishment. 15 / 33 (31 / 69%) 6 / 14 (30/70%)
Chi Square = 9.95000 DF = 3 Prob. = 0.0190
The results are probably significant, the teachers *disagree* with the statement.

16. Boys are more confident than girls. 12 / 34 (26 / 74%) 5 / 15 (25/75%)
Chi Square = 15.5217 DF = 3 Prob. = 0.0014
The results are significant, most teachers *disagree* with the statement.

17. Girls rely on the opinion of peers more than boys do. 19 / 26 (42 / 58%) 3 / 16 (16/84%)
Chi Square = 9.98363 DF = 3 Prob. = 0.0187
The results are probably significant - especially for male teachers who overwhelmingly *disagree* with the statement.

18. Girls are more likely than boys to say mathematics and/ technology class is hard. 22 / 20 (52 / 48%) 6 / 14 (30/70%)
Chi Square = 3.29524 DF = 3 Prob. = 0.3483
The results support the null hypothesis, although more male teachers disagree with the statement.

19 Boys are more likely than girls to aspire to careers in mathematics and technology	26 63	15 37%	12 75.25% 4
Chi Square = 0.95122 DF = 3 Prob = 0.0735			
The results support the null hypothesis, although most teachers agree with the statement			
20 Most teachers understand and use 'gender correct' language	26 70	11 30%	5 7 12.58%
Chi Square = 0.41441 DF = 3 Prob = 0.0931			
The results support the null hypothesis, although most female teachers agree with the statement			

Teacher Views from the Open-Ended Question

Female teachers believe that times have changed: *"As teachers are made aware of "gender correct vocabulary and gender preferences," some improvement in subtle messages sent in the classroom will occur."* Others believe there is too much fuss over this topic: *"As per 'gender correct' language, I think that some people take this to a ridiculous extreme and read too much into things."* They think that understanding gender correct language is fundamental: *"As a foreign language teacher I am very aware of 'feminine' and 'masculine' words because they are part of the language. I stress the correctness of gender language in my classroom."* But not all teachers are aware of gender equity: *"I've always been cognizant of gender treatment in my classroom, but find most of my fellow teachers and interns not to be aware of gender equity."* Teachers recognize that consciousness raising can be fostered: *"Teachers should tape a lesson and do a gender analysis - I did, boy I thought I was perfect - was I wrong."* Teachers remarked that differences may be developmental: *"The majority of sixth grade girls are at a higher maturity level and therefore excel in all areas. I have noticed significant differences in girls achievement - with the exception of the advanced group. Boys are found to believe that getting A's and doing well is 'nerdy'. I do not see girls following this pattern."* Another teacher, who herself is doing research into gender equity said, *"There has been gender bias and/ or stereotyping going on for decades in the classroom. The*

AAUW is correct in its assumption that 'Schools do shortchange girls'. However, recognition is half of the problem and I believe things are changing."

According to one male teacher there really is no problem: *"I don't perceive any difference in ability levels or achievement in the courses I teach."* Others felt that staff development training is necessary: *"Many teachers are used to a 'routine' language and style of presentation in their class in some cases this 'style' is currently considered gender harmful - a workshop should be arranged to make the teachers aware of unintentional prejudices."*

DISCUSSION

The responses of the teachers reflect their knowledge of the issues surrounding gender equity and equitable behaviors in the classroom. However, according to the students, the teachers are not treating them equitably. The dichotomy may lie in unconscious well-intended behaviors that have been ingrained and practiced for so many years that teachers automatically respond in certain ways to boys and girls. It would seem that knowledge of an issue does not directly relate to changes in behavior. Furthermore, teachers themselves have been socialized over their lifetimes to believe certain stereotypes about genders and have also had the same experiences as their students. It is very difficult to convert a belief system that has existed for years and has been condoned and accepted by society into behaviors that run contrary to this belief system.

CONCLUSIONS

It appears from the results of this survey of 5-8th grade boys and girls, their teachers and counselors, that, on the topic of gender equity, there are areas for optimism, areas for concern and areas in need of further study.

First the good news:

Teachers believe that girls and boys are called on equally. They feel that they encourage girls to explain their answers and praise them for the same reasons as boys. Teachers do not think boys are better in mathematics or that boys' work is more complete. Most do not see a difference in the confidence level between genders and do not consider that girls rely more on the opinion of peers. It appears that over the last twenty years, there has been some positive impact on teachers' perceptions that women can have careers in mathematics and technology. Teachers think there are fewer women than men in mathematics careers.

Students agree that teachers call on boys and girls equally and find the answers of either group interesting depending on what they have to say.

Next the bad news:

Students say that teachers find girls work neater than boys and that many female teachers favor girls and male teachers favor boys. They suggest that teachers do not speak to, nor discipline boys and girls in the same way. The students feel that the media does not represent boys and girls in the same way. In addition, the survey cautions that guidance counselors and teachers need to realize that girls and boys are not being encouraged (at these ages) to study mathematics and science at advanced levels.

Areas that need further study:

From this research, and from the current literature, we have not yet obtained a good sense of how teachers encourage boys and girls to explain their answers in mathematics or expect them to demonstrate their understanding in technology courses. We need to discover how teachers can be sensitized to their *teacher talk and pre-judgments of boys and girls* to facilitate greater equity. Since students feel that the media does not represent them equally, we also need to get this message to the publishers of books and the programmers of film and other media. We further suggest that much work needs to be done to determine how the community, along with the schools, can counsel youngsters

towards careers in mathematics and technology through advanced course selection, more realistic media representation, and community exposure. And finally the survey points up that we need to reconcile the *voices* of youngsters who feel **inequities in treatment** with regard to sports programs that evidently are not equal.

Because the voices of the students were so strong in the open-ended statement we intend, through workshops and classes, to expose other students and faculty to the issue of gender equity. We expect to continue to work collaboratively with groups to sort out the hidden curriculum and unconscious, well-intended biases that are cheating our girls and boys from engaging as partners in full participation in sports, school, and society.

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APPENDICES

APPENDIX A

Student Survey

This is an opinion poll. There are no right or wrong answers. Please say if you agree or disagree with the following statements, your name will not be on the paper.

Thank you.

COMPLETE THIS LINE: boy or girl age: grade:

PLEASE WRITE AGREE OR DISAGREE TO EACH STATEMENT BELOW

_____1. Teachers speak to boys and girls in the same way.

_____2. Books, posters and ads show girls and boys doing activities that are the same.

_____3. Teachers call on girls less often than boys.

_____4. Teachers think boys answers are more interesting than girls answers.

_____5. Teachers think girls work is neater than boys work.

_____6. Girls are encouraged to study mathematics and technology at advanced levels.

_____7. Boys are encouraged to study mathematics and technology at advanced levels.

_____8. Girls and boys have equal opportunities to play sports.

_____9. Teachers encourage girls to explain their answers in mathematics.

_____10. Teachers encourage girls to demonstrate their understanding of technology.

_____11. People think boys are better in technology and mathematics.

_____12. There are few women in mathematics and technology careers.

PLEASE WRITE YOUR OWN TRUE STATEMENT ABOUT HOW BOYS AND GIRLS MAY BE TREATED DIFFERENTLY IN SCHOOL.

APPENDIX B

Counselor Survey

Dear Colleague,

A nationwide poll was conducted by the American Association of University Women in 1990 to assess self-esteem, school and classroom experiences, interest and ability in mathematics and technology, and career aspirations of girls and boys between the ages of 9 and 15.

In summary among their key findings were, "Adolescence is a tough time for both girls and boys. As girls and boys grow older, both experience a significant loss of self-esteem in a variety of areas, however, the loss is most dramatic and has the most long-lasting effect for girls."

I have been working with a few colleagues in other-than-school settings to explore these findings and I would appreciate your input as well.

If you are willing, please respond "agree or disagree" to the attached statements, or simply return the form to me unanswered. In either case please return the attached survey.

I am Male _____ Female _____ # years experience _____

Number of BOYS _____ GIRLS _____ in your caseload.

# of BOYS _____ GIRLS _____ in elective mathematics courses.

# of BOYS _____ GIRLS _____ electing technology courses.

# of BOYS _____ GIRLS _____ expressing career choices in either mathematics or technology related fields.

If you see any difference in the pursuit of careers in mathematics or technology between boys and girls, what is your opinion of the possible reason for this difference?

If you feel there are areas of difference in the educational experiences of girls and boys could you discuss them briefly NOW.

APPENDIX C

Teacher Survey

Dear Colleague,

A nationwide poll was conducted by the American Association of University Women in 1990 to assess self-esteem, school and classroom experiences, interest and ability in mathematics and technology, and career aspirations of girls and boys between the ages of 9 and 15.

In summary among their key findings were, "Adolescence is a tough time for both girls and boys. As girls and boys grow older, both experience a significant loss of self-esteem in a variety of areas; however, the loss is most dramatic and has the most long-lasting effect for girls."

I have been working with a few colleagues in other-than-school settings to explore these findings and I would appreciate your input as well.

If you are willing, please respond "agree or disagree" to the attached statements, or simply return the form to me unanswered. In either case please return the attached survey.

Teacher Survey

This survey is intended to look at unconscious, well-intended biases which may exist. These are general statements and may or may not apply to you. Please answer from your own experience and your knowledge of others.
Answer Agree or Disagree according to how you honestly feel.

Subject or Grade Taught _____ **Years of Experience** _____
Male _____ **Female** _____

1. Boys are more likely than girls to be called on in the classroom.
2. Boys usually answer questions with greater clarity than girls.
3. Girls and boys are encouraged to study for careers in mathematics at advanced levels.
4. Girls and boys are encouraged to study for careers in technology (information/communication) at advanced levels.
5. More boys than girls study mathematics at advanced levels.
6. More boys than girls study for careers in technology.
7. Textbooks and other print and film matter show girls and boys doing the same activities.
8. Teachers speak to boys and girls in the same way.

9 Teachers encourage girls and boys to explain their answers fully or demonstrate how they got their answers

10 Boys are usually better at mathematics than girls

11 There are fewer women than men in mathematics careers

12 Boys are more likely than girls to speak up in class

13 Boys are more likely than girls to argue with the teacher when they think their answer is right

14 Boys work is more complete than girls work

15 Girls work is praised for appearance, boys work for accomplishment

16 Boys are more confident than girls

17 Girls rely on the opinion of peers more than boys do

18 Girls are more likely than boys to say mathematics and technology class is hard

19 Boys are more likely than girls to aspire to careers in mathematics and technology

20 Most teachers understand and use 'gender correct' language

Please add your own observation about gender equity on the back

APPENDIX D

STATEMENT ONE: ***Teachers speak to boys and girls in the same way.***

Comparison of boys in grades 5-6 to boys in grades 7-8

5-6			7-8		
Agree	**88**	**47%**	**Agree**	**115**	**40%**
Disagree	**98**	**53%**	**Disagree**	**170**	**60%**

CHI SQUARE = 11.1672 DF = 3 PROB = 0.0109

Comparison of girls in grades 5-6 to girls in grades 7-8

5-6			7-8		
Agree	112	54%	Agree	137	43%
Disagree	94	46%	Disagree	182	57%

CHI SQUARE = 7.9278 DF = 3 PROB = 0.047

Comparison of boys in grades 5-6 to girls in grades 5-6

boys			girls		
Agree	88	47%	Agree	112	54%
Disagree	98	53%	Disagree	94	46%

CHI SQUARE = 2.12601 DF = 3 PROB = 0.546?

Comparison of boys in grades 7-8 to girls in grades 7-8

Agree	115	40%	Agree	137	43%
Disagree	170	60%	Disagree	182	57%

CHI SQUARE = 16.9620 DF = 3 PROB = 0.0007

STATEMENT TWO: ***Books, posters and ads show girls and boys doing activities that are the same.***

Comparison of boys in grades 5-6 to boys in grades 7-8

5-6			7-8		
Agree	68	38%	Agree	138	48%
Disagree	109	62%	Disagree	147	52%

CHI SQUARE = 10.1962 DF = 3 PROB = 0.0031

Comparison of girls in grades 5-6 to girls in grades 7-8

5-6			7-8		
Agree	97	47%	Agree	128	40%
Disagree	109	53%	Disagree	193	60%

CHI SQUARE = 13.8610 DF = 3 PROB = 0.0031

Comparison of boys in grades 5-6 to girls in grades 5-6

boys			girls		
Agree	68	38%	Agree	97	47%
Disagree	109	62%	Disagree	109	53%

CHI SQUARE = 10.1962 DF = 3 PROB = 0.0031

Comparison of boys in grades 7-8 to girls in grades 7-8

boys			girls		
Agree	138	48%	Agree	128	40%
Disagree	147	52%	Disagree	193	60%

CHI SQUARE = 13.4401 DF = 3 PROB = 0.0038

APPENDIX E

STATEMENT THREE: ***Teachers call on girls less often than boys.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	50	28%	Agree	52	22%
Disagree	130	72%	Disagree	188	78%

CHI SQUARE = 112.622 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	41	20%	Agree	64	20%
Disagree	160	80%	Disagree	255	80%

CHI SQUARE = 184.813 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	50	28%	Agree	41	20%
Disagree	160	72%	Disagree	160	80%

CHI SQUARE = 106.008 DF = 3 PROB = 0.0000

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	52	22%	Agree	64	20%
Disagree	188	78%	Disagree	255	80%

CHI SQUARE = 191.427 DF = 3 PROB = 0.0000

STATEMENT FOUR: ***Teachers think boys answers are more interesting than girls .***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	57	32%	Agree	35	12%
Disagree	119	68%	Disagree	231	88%

CHI SQUARE = 166.262 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	95	46%	Agree	41	13%
Disagree	113	54%	Disagree	279	87%

CHI SQUARE = 178.570 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	57	32%	Agree	95	46%
Disagree	113	68%	Disagree	113	54%

CHI SQUARE = 23.3986 DF = 3 PROB = 0.0000

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	35	12%	Agree	41	13%
Disagree	231	88%	Disagree	279	87%

CHI SQUARE = 321.434 DF = 3 PROB = 0.0000

APPENDIX F

STATEMENT FIVE: ***Teachers think girls work is neater than boys work.***

Comparison of boys in grades 5-6 to boys in grades 7-8

5-6			7-8		
Agree	108	59%	Agree	195	69%
Disagree	75	41%	Disagree	89	31%

CHI SQUARE = 45.5142 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

5-6			7-8		
Agree	95	46%	Agree	200	63%
Disagree	113	54%	Disagree	120	37%

CHI SQUARE = 21.5577 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

boys			girls		
Agree	108	59%	Agree	95	46%
Disagree	75	41%	Disagree	113	54%

CHI SQUARE = 7.50851 DF = 3 PROB = 0.0573

Comparison of boys in grades 7-8 to girls in grades 7-8

boys			girls		
Agree	195	69%	Agree	200	63%
Disagree	89	31%	Disagree	120	37%

CHI SQUARE = 59.5634 DF = 3 PROB = 0.0000

STATEMENT SIX: ***Girls are encouraged to study mathematics and technology at advanced levels.***

Comparison of boys in grades 5-6 to boys in grades 7-8

5-6			7-8		
Agree	83	47%	Agree	113	41%
Disagree	94	53%	Disagree	165	59%

CHI SQUARE = 10.4102 DF = 3 PROB = 0.0154

Comparison of girls in grades 5-6 to girls in grades 7-8

5-6			7-8		
Agree	104	54%	Agree	105	35%
Disagree	88	46%	Disagree	199	65%

CHI SQUARE = 30.3991 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

boys			girls		
Agree	83	47%	Agree	104	54%
Disagree	94	53%	Disagree	88	46%

CHI SQUARE = 2.01695 DF = 3 PROB = 0.5689

Comparison of boys in grades 7-8 to girls in grades 7-8

boys			girls		
Agree	113	41%	Agree	105	35%
Disagree	165	59%	Disagree	199	65%

CHI SQUARE = 38.7924 DF = 3 PROB = 0.0000

APPENDIX G

STATEMENT SEVEN: ***Boys are encouraged to study mathematics and technology at advanced levels.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	81	47%	Agree	125	42%
Disagree	93	53%	Disagree	160	58%

CHI SQUARE = 5.12583 DF = 3 PROB = 0.1628

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	80	40%	Agree	128	42%
Disagree	121	60%	Disagree	178	58%

CHI SQUARE = 16.5331 DF = 3 PROB = 0.0009

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	81	47%	Agree	80	40%
Disagree	93	53%	Disagree	121	60%

CHI SQUARE = 9.19077 DF = 3 PROB = 0.0269

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	125	42%	Agree	128	42%
Disagree	160	58%	Disagree	178	58%

CHI SQUARE = 12.4192 DF = 3 PROB = 0.0061

STATEMENT EIGHT: ***Girls and boys have equal opportunities to play sports.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	97	54%	Agree	184	65%
Disagree	82	46%	Disagree	97	35%

CHI SQUARE = 28.1929 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	133	66%	Agree	180	56%
Disagree	68	34%	Disagree	141	44%

CHI SQUARE = 25.7582 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	97	54%	Agree	133	66%
Disagree	82	46%	Disagree	68	34%

CHI SQUARE = 22.2769 DF = 3 PROB = 0.0000

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	184	65%	Agree	180	56%
Disagree	97	35%	Disagree	141	44%

CHI SQUARE = 31.6743 DF = 3 PROB = 0.0000

APPENDIX H

STATEMENT NINE: ***Teachers encourage girls to explain their answers in mathematics.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	88	50%	Agree	108	39%
Disagree	87	50%	Disagree	172	61%

CHI SQUARE = 14.6343 DF = 3 PROB = 0.0022

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	83	41%	Agree	122	38%
Disagree	118	59%	Disagree	196	62%

CHI SQUARE = 23.3147 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	88	50%	Agree	83	41%
Disagree	87	50%	Disagree	118	59%

CHI SQUARE = 6.10024 DF = 3 PROB = 0.1068

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	108	39%	Agree	122	38%
Disagree	172	61%	Disagree	196	62%

CHI SQUARE = 31.8487 DF = 3 PROB = 0.0000

STATEMENT TEN: ***Teachers encourage girls to demonstrate their understanding of technology.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	88	49%	Agree	109	36%
Disagree	92	51%	Disagree	193	64%

CHI SQUARE = 23.4531 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	79	41%	Agree	122	38%
Disagree	113	59%	Disagree	200	62%

CHI SQUARE = 24.9152 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	88	49%	Agree	79	41%
Disagree	92	51%	Disagree	113	59%

CHI SQUARE = 6.10972 DF = 3 PROB = 0.0164

Comparison of boys in grades 7-8 to girls in grades 7-8

	boys			girls	
Agree	109	36%	Agree	122	38%
Disagree	193	64%	Disagree	200	62%

CHI SQUARE = 42.2586 DF = 3 PROB = 0.0000

APPENDIX I

STATEMENT ELEVEN: ***People think boys are better in technology and mathematics.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	63	39%	Agree	92	32%
Disagree	98	61%	Disagree	197	68%

CHI SQUARE = 15.7575 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	50	25%	Agree	124	39%
Disagree	151	75%	Disagree	193	61%

CHI SQUARE = 65.7702 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	63	39%	Agree	50	25%
Disagree	98	61%	Disagree	151	75%

CHI SQUARE = 58.3599 DF = 3 PROB = 0.0000

STATEMENT TWELVE: ***There are few women in mathematics and technology careers.***

Comparison of boys in grades 5-6 to boys in grades 7-8

	5-6			7-8	
Agree	66	43%	Agree	97	34%
Disagree	84	57%	Disagree	183	66%

CHI SQUARE = 29.4429 DF = 3 PROB = 0.0000

Comparison of girls in grades 5-6 to girls in grades 7-8

	5-6			7-8	
Agree	55	28%	Agree	108	34%
Disagree	141	72%	Disagree	205	66%

CHI SQUARE = 67.7954 DF = 3 PROB = 0.0000

Comparison of boys in grades 5-6 to girls in grades 5-6

	boys			girls	
Agree	66	43%	Agree	55	28%
Disagree	84	57%	Disagree	141	72%

CHI SQUARE = 40.7633 DF = 3 PROB = 0.0000

Comparison of boys in grdes 7-8 to girls in grades 7-8

	boys			girls	
Agree	97	34%	Agree	108	34%
Disagree	183	62%	Disagree	205	66%

CHI SQUARE = 56.3845 DF = 3 PROB = 0.0000